GEOGRAPHIC SCHOOL BULLETINS

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(The National Geographic Society is a scientific and educational Society, wholly altruistic, incorporated as a non-commercial institution for the increase of geographic knowledge and its popular diffusion. General Headquarters, Washington, D. C.)

Contents for Week of May 11, 1942. Vol. XXI. No. 11.

1. Fog-Shrouded Aleutian Islands Are U. S. "Gangplank" Toward Asia
2. Madagascar, France's Queen Island of the Indian Ocean
3. Women at Work: How Aunt America Helps Uncle Sam Fight
4. Strategic Materials (No. 12): Quartz Crystal, Robot Boss of Radio Waves
5. Geo-Graphic Brevities

B. Anthony Stewart

WOMEN WORKERS HAVE WAR AT THEIR FINGERTIPS

The quiet job of sorting rivets and arranging them on frames is tame in appearance, but it contributes to the final completion of fighting aircraft. These war workers in a San Diego, California, aircraft plant wear the generally adopted uniform of slacks. The rivets they line up by the dozen will be handed over to men for the heavier work of assembling the plane, although in some factories women also are riveting. To the 2,322,000 women already employed in manufacturing in 1940, Uncle Sam has added a growing army of feminine recruits to push the war effort on the production front (Bulletin No. 3).

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic School Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers in the United States and its possessions for one year upon receipt of 25 cents (stamps or money order); in Canada, 50 cents. Entered as second-class matter, Jan. 27, 1922, Post Office, Washington, D. C., under act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103, Act of Oct. 3, 1917, authorized Feb. 9, 1922. Copyright, 1942, by National Geographic Society, Washington, D. C. International copyright secured. All rights reserved. Quedan reservados todos los derechos.

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Fog-Shrouded Aleutians Are U. S. "Gangplank" Toward Asia

THE Aleutian Islands south and west of Alaska, where U. S. defense works are being rushed to completion, have been long talked of as a base for attack on Japan. They extend within about 750 miles of Japan's northern Kurile Islands.

Remote as the Aleutians seem to many people in the United States, the normal Great Circle steamer route between northwestern United States ports and Japan passes only about 200 miles south of the long curving island chain.

Islands Without a Tree Loom Large in Pacific Strategy

One of the Aleutians, Unalaska Island, where a new U. S. naval station and an air base are being established, lies about 2,000 miles from San Francisco and the same distance from Honolulu. The western third of the 1,500-mile-long archipelago extends beyond the 180th Meridian, the imaginary dividing line which is the International Date Line. But a westward angle of the Date Line arbitrarily puts all the Aleutians on the east side, along with North America.

The Aleutians form a strange world of their own, with volcanoes pouring out great volumes of steam, with islets popping out of the sea and vanishing again as mysteriously, with fog-chilled winds howling over grassy moors.

Of the hundreds of volcanic islands, many are mere surf- and wind-scoured rocks. Largest is Unimak Island, which measures 65 by 22 miles. Unimak is notable also for having the highest peak—the symmetrical 9,387-foot Shishaldin volcano.

Trees do not thrive on the Aleutians. Natives depend on driftwood and animal oils for fuel. There is verdant growth of grasses and flowering plants, however, and on Unmak Island an American operates a sheep ranch with about 15,000 head.

Storms Affect U. S. Climate

Fogs and gales in the Aleutians are regular fare. Average annual temperatures are remarkably uniform, seldom dropping below freezing in winter and rarely reaching 60 degrees in summer. This unusual weather is due to the warm Japan Current. The warm air from this current, mixing with the cold air of Bering Sea, makes the Aleutians a northern "weather-kitchen" which brews storms that eventually affect the climate of the United States.

Most important of the islands and one of the largest of the Aleutians is Unalaska, near the east end of the chain. In Dutch Harbor, on the shore of a tiny island in Unalaska Bay, the United States has been constructing defense works vital to the protection of the northwestern approaches to North America.

West of Unalaska is Bogoslof Island, famous for its jack-in-the-box antics. Its volcanic peaks and outlying islets have appeared and disappeared time and again, particularly between 1900 and 1907.

U. S. DEFENSE BASES

This is one of a series of bulletins on U. S. defense bases. Some of the BULLETINS are still available in limited quantities at the Washington, D. C., headquarters of the National Geographic Society. Teachers whose subscriptions began after this series started, or who wish to replace copies missing from their files, may obtain these BULLETINS free of charge as long as the supply lasts.

Bulletin No. 1, May 11, 1942 (over).

UMI

Luis Marden

A SLIVER OF CRYSTAL HELPS SAVE MODERN AIR TRAFFIC FROM CRASHES AND COLLISIONS

The fifteen airliners which New York City's LaGuardia Field can handle at once could encounter serious air-traffic jams if the control tower were unable to give directions to all planes approaching, landing, or taking off. To control the frequency of transmitters for aircraft and control towers alike, radios of both have a quartz crystal "control" to keep the air waves within prescribed limits for each frequency. Some sets have eight or ten crystals, so that they can operate on as many frequencies (Bulletin No. 4).

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Madagascar, France's Queen Island of the Indian Ocean

THE fourth largest island in the world, rich Madagascar off Africa's southeast coast, has been much wooed by both sides since the war has moved into the Indian Ocean. For the United Nations, the island would offer a base to protect shipping lifelines between South African or Atlantic ports and embattled India and Australia; for Axis nations, a base for raiding those same sea lanes.

Madagascar is France's largest island possession, and is the chief territory under French rule in the Indian Ocean. Before the war, four-fifths of the colony's exports went to France, and three-fourths of its imported supplies came from the European homeland. The island was made a French colony in 1895, after a 15-year period of occasional hostilities.

Stringbean Shape Shields Africa for Nearly 1,000 Miles

There are more than 25,000 French living on the island, and over 14,000 foreigners of other nationalities. Natives of various Malagasy tribes make up the remainder of the population of nearly 4,000,000.

Greenland, New Guinea, and Borneo alone surpass in size this tropical French island. Its area of 228,500 square miles makes it a little smaller than Texas, a little larger than California. Its unusual stringbean shape, however, gives it a length of 980 miles. If superimposed on the U. S., it would extend from Chicago to Dallas, Texas. On the average, its width is no more than 250 miles except near the center.

It lies stretched out along Africa's coast, 240 miles from Mozambique (Portuguese East Africa) across the Mozambique Channel. From coastal plains it rises in successive ranges to a high, bare, and moorlike plateau edged with cliffs, above which tower rugged mountain masses. Forest belts of mahogany, ebony, rosewood, and sandalwood ring the island along the coast. In the lowlands raffia palm, beefwood, tamarind, mango, and spices thrive.

Non-African Natives Until Slave Traders Came

Harbors are few. Only coral reefs protect Tamatave, leading port on the east coast. Diégo Suarez (Antsirane), however, in the extreme north, has one of the finest natural harbors in the world. It is the chief commercial port of the island and has served the French as a naval base. The weather is generally tropical, although the interior highlands have a mild and healthful climate.

Tananarive (Antananarivo), the capital in the eastern interior (illustration, next page), is connected by the island's longest railway with the east coast port of Tamatave, and by road with the western port of Majunga, and other towns. There are three other railroads of about 100 miles each. In 1936, there were more than 15,750 miles of roads suitable for motor traffic—in the dry season.

Agriculture is the island's chief occupation, but farming methods are still primitive. Rice is the staple crop. In addition, Madagascar produces coffee, vanilla, cocoa, spices, a little rubber, sugar, millet, corn (maize), cotton, and tobacco, as well as cattle, pigs, sheep, and goats.

The industries of Madagascar include silk and cotton weaving, metal working, the manufacture of straw hats. Graphite, mica, phosphates, and corundum are mined, as well as several kinds of precious stones.

UMI

Akutan, also in the eastern Aleutians, assails one's nostrils before it is seen; it has a big whaling station. In good seasons as many as 200 whales are taken by Akutan boats.

Island Arc Reaches to Asia

Westward from Unmak Island lie the Islands of the Four Mountains and the long Andreanof chain. Almost uninhabited, the islands continue for 500 miles to Attu, westernmost of the American Aleutians. Farther to the northwest lie Russia's Commander Islands (Komandorskie Ostrova), which complete the Aleutian island arc from North America to Asia.

A few whites trade in the Aleutians, operate fisheries and whaling stations, and breed foxes, especially the blue fox variety.

Fishing, hunting, and trapping occupy the few hundred natives, who are descendants of the once-numerous Aleut people. A sturdy and enterprising Asiatic folk, they were reduced in number by early Russian traders. Hunting the sea otter, whose pelts made the original Russian traders rich, now is forbidden.

Note: Additional information on Alaska and the Aleutian Islands may be found in the following articles in the *National Geographic Magazine:* "Our Air Frontier in Alaska," October, 1940; "Exploring Frozen Fragments of American History," May, 1939; and "A World Inside a Mountain," September, 1931. See also the following GEOGRAPHIC SCHOOL BULLETINS: "Alaska Celebrates 75 Years with Uncle Sam," January 26, 1942; "Big Diomede and Little Diomede: Russia 2 Miles from U. S. A.," February 17, 1941; "World's Largest Non-Polar Icecap Found in Alaska," October 3, 1938; and "Alaska's Wealth Now Recognized Among Sea Treasures," May 9, 1938.

Alaska and the Aleutian Islands may be found on the National Geographic Society's new Map of North America, issued as a supplement to the May, 1942, number of the *Magazine.*

Bulletin No. 1, May 11, 1942.

Bernard R. Hubbard

THE EARTH ITSELF PROTECTS THE ALEUTS FROM WINTER COLD

White men found the Aleutians inhabited by natives akin to Eskimos, who built snug winter huts of stone and driftwood covered with sod. Although they have adopted shoes, caps, and clothing of American type, the Aleuts still build half-underground homes for winter. In summer they live in tents. These boys are sons of an Aleut who migrated to the Alaskan mainland to work in a cannery, but kept his native style of architecture.

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Women at Work: How Aunt America Helps Uncle Sam Fight

THE man behind the man behind the gun may be a woman now. The announcement that the Man Power Mobilization Commission will at some future time register and mobilize women too has called attention to the distaff side of war industries.

In January a half-million women were already enlisted in industrial work on war orders, and by now the women's labor army is nearer a million strong. Before 1942 closes, possibly 6,000,000 more can be recruited, according to estimates of the Labor Department's Women's Bureau.

These newcomers to the manufacturing field are entering a realm where in 1940 women workers already numbered more than 2,322,000. They are changing old ratios, in which clerical and salesgirl jobs (in most States) outnumbered openings for women as factory workers, servants, or in the professions. Professional women, counting more than 800,000 teachers, usually account for less than a sixth of feminine employment.

Laying down the embroidery needle and picking up a rivet, U. S. women workers are exercising their nimble fingers on such jobs as assembling the frames of aircraft, arc welding, making radios and other instruments for war machines, grinding lenses, making rubber tires for tanks, stitching parachutes.

In a sample 17 aircraft factories, women accounted for from 3 per cent to half of all employees, as many as 1,400 of them at work in one plant.

British Women Make Up Half of England's Aircraft Workers

Their share in producing the tools of war, however, does not yet approach the part played by the women of England in British output. English aircraft plants count on the weaker sex for about 50 per cent of their workers. During the first World War, the United States' budding aircraft industry drew a quarter of its workers from the reservoir of feminine energy.

From a sewing machine at home to a speedier needle at the factory is a relatively easy shift for many women aircraft workers. They stitch covers for the airplane's control surfaces—the ailerons, wing tabs, elevators, and rudders.

Less traditional is the work they do—in numbers still limited—on covering a plane with its metal "skin" by riveting, a skill which a few have acquired as a war-substitute for crocheting. While most riveting is in the hands of masculine workers, rivets themselves pass through feminine fingers (illustration, cover).

In other capacities also they prepare aircraft parts for the men who do the heavier work of the assembly line. Metal parts that have been roughly shaped by machine are filed and polished by feminine fingers. Women wrap the gasoline feed lines for engines to aid in identification.

In the delicate instruments which are the aircraft's brains, women have a larger share of the work. With pliers and drills, files, tweezers, and hand mallets they fasten together the carefully aligned parts of various instruments such as the magnetic compass, and have a partial responsibility also in the work of testing.

This BULLETIN supplies information for use with Unit IV (III, D. Utilizing the services of women), in the U. S. Office of Education handbook, "What the War Means to Us."

UMI

Before the war, the United States imported yearly a million dollars' worth of Madagascar's cloves and vanilla beans, and several million pounds of graphite.

Madagascar's Malagasy natives are not related to African races. They resemble Sumatrans, and seem to be of Malayan or Polynesian stock. The first Africans were brought there in the 9th century as slaves by Arab traders. The Arabs went there chiefly for the mahogany, rosewood, ebony, and sandalwood.

Note: Further information on Madagascar may be found in "Across Madagascar by Boat, Auto, Railroad, and Filanzana," in the *National Geographic Magazine*, August, 1929. "Madagascar, Mystery Island" will appear in the *Magazine* for June, 1942.

Madagascar is shown on the National Geographic Society's Map of the Indian Ocean. A price list of maps may be obtained from the Society's headquarters in Washington, D. C.

Bulletin No. 2, May 11, 1942.

Charles F. Swingle

BEASTS AND BICYCLES COMPLICATE TANANARIVE'S TRAFFIC PROBLEM

Inland Tananarive, capital of Madagascar, is connected with Majunga on the west coast by the Great North Road, a mediocre highway. This city of 70,000 has changed little in the nearly half-century of French occupation. Angular, boxy little houses of raw brick still climb the hill, and below them flows a stream of assorted traffic—sun-helmeted Europeans on foot or in filanzanas (chairs swung from poles on the shoulders of natives), automobiles, and placid oxen hauling carts of rice, geese, eggs, and baskets to market. The Malagasy have adopted European styles only in spots. The native pushing the bicycle has combined an out-of-date straw hat with the standard native garment, the lamba. This flowing robe, usually made of unbleached muslin, has many uses, ranging from a blanket to a net for catching locusts which are a favorite food.

The following form may be used (or copied) for ordering Bulletins:

School Service Department
National Geographic Society
Washington, D. C.

Kindly send.....copies of the GEOGRAPHIC SCHOOL BULLETINS weekly for one school year for classroom use, to

Name .....

Address .....

I am a teacher in.....School.....Grade

I enclose 25¢ for each subscription (in U. S. or its possessions; in Canada, 50¢; only U. S. money can be accepted): Total Amount.....

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Strategic Materials (No. 12): Quartz Crystal, Robot Boss of Radio

"SCOUT CAR 7, investigate accident at Main and Elm Streets." . . . "Calling LaGuardia Airport. Calling LaGuardia Airport." . . . "This is London." . . . "Into the silent night the Lone Stranger rides again. Now, if you will send 10¢ and a boxtop . . ." . . . "Bringing you the silken strains of that world-famous orchestra. . . ." . . . "06 and 012, flight cleared over Minneapolis, 6,000 feet. Go ahead." . . . "My friends . . ." . . . "sixteen delicious flavors. Ask your grocer. . . ."

The apparently tranquil air is surging with invisible radio waves in war times: radio beams guiding planes, harbor patrols, broadcasts rippling with jokes and music, police radio. Army and Navy planes, ships at sea, soldiers in tanks, sailors in torpedo boats keep in touch by radio. Unless each of these hundreds of thousands of transmitters operates on its assigned frequency, reception would be uncertain, lives endangered. The traffic cop of the airways, that keeps the waves within lawful limits, is a sliver of transparent stone about the shape of a pat of butter—a slice or "plate" of quartz crystal.

No substitute is known for the crystal "cop" on its radio beat. No suitable crystals are found in the U. S. Practically the whole world supplied itself from Brazil until last year when the U. S. contracted to buy all that country produced.

The Workaday Gem That Nature's Geometry Built

Clear quartz crystal rules the waves from radio transmitters because of a peculiar talent known as piezo-electric reaction. When subjected to stress or pressure (piezo comes from the Greek for "pressure"), the crystal develops an electric charge. Likewise, when electric charges are applied, the quartz expands and contracts, vibrating rapidly. In the oscillator radio tube, the quartz crystal reacts to electric current by vibrating at the desired rate (for which it was designed) with greater constancy than any man-made electrical mechanisms.

How can a chip of deaf, dumb rock be a vigilant electrical watchman? The quartz is effective only when it occurs in a perfect crystal, a smooth-faceted, sharp-angled solid as self-contained as an egg, but growing in the ground on a geometrical pattern like something alive. Chemically, it is pure silicon dioxide, a supersize transparent cousin to a grain of flinty sand. Its jewel-smooth flashing facets gave it a fascination for primitive man. He thought it was water magically changed to stone. It still has a slight gem popularity, as a sort of poor man's diamond. Impurities make black onyx, pink or yellow agate, and other semi-precious stones.

In the form that rules radio, quartz crystal has a personality all its own. Its slow-growing, sparkling crystals occur in Brazil, chiefly in Minas Geraes, in hexagonal shapes with more than 100 variations. They vary from the size of a finger to the 10,363-pound record-breaking giant dug up in 1939. A crystal may

This BULLETIN supplies data for use with Unit IV (II. We gear our industries to war needs), in the Office of Education handbook, "What the War Means to Us."

Strategic materials, essential to industry's war effort, were defined by the Army and Navy Munitions Board as those defense materials for which the U. S. must depend to a large extent on foreign sources. The GEOGRAPHIC SCHOOL BULLETINS have been presenting a series of articles on these materials, their use, their peculiar qualities, and the countries which supply them.

UMI

Where Sewing Is Close to Explosives

In general, the woman gets the lighter job, on the assumption that her strength is 57 per cent as great as a man's, her resistance about 67 per cent.

It is in arsenals and plants manufacturing ammunition, however, that women workers are really numerous, constituting sometimes as many as three-fourths of all the plant operatives. A homely chore is the sewing of silk bags to hold powder for heavy guns and cannon. More hazardous is the job of sewing up the last opening in the bag after it has been loaded with explosive black powder. To avoid the danger of igniting the powder by a chance spark, the woman at the sewing machine must wear clothing entirely free from metal, even zipper closings for her dress or nails in her shoes. The sewing-machine needle is of bronze.

The metal clips which hold five rounds of rifle cartridges are made and filled by women workers in one Government arsenal. Cartridges elsewhere are loaded into their paperboard packages by women, then the packages into larger cartons.

One of the deadlier products of feminine fingers is the mechanical time fuse for artillery shells. More than 100 parts must be fitted together for the fuse, which with its tiny hair springs and weights resembles a watch movement.

Women also make the smaller bullets, the armor-piercing bullets, and some parts of the larger tracer bullets. Less unusual is their employment in making uniforms for both the Army and the Navy.

Bulletin No. 3, May 11, 1942.

Volkmar Wentzel

WOMEN WORKERS TURN THE WHEELS OF AGRICULTURE AS WELL AS INDUSTRY

The rural women of America know that mechanized war gets off to a good start down on the mechanized farm, where food for fighting men is produced. In Orange County, New York, a resourceful farm woman has already learned to speed the plowing by driving a home-made tractor to pull the plow. The odd vehicle was made by welding together the front and rear sections of an old automobile. Predicting that every second man in the U. S. would be fighting or working on war jobs by the end of 1942, the newly created Man Power Board has turned public attention to woman power as a substitute in jobs formerly held by men on farms and in cities as well. The 1940 census found women farm workers only a little less numerous than school teachers. Some 485,000 depended on farm work for their living, and an additional quarter-million were in domestic service on farms, without counting helpful farmers' wives and daughters.

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Geo-Graphic Brevities

TEXTILE-FAMED MADRAS HAS ENRICHED THE ENGLISH LANGUAGE

MADRAS'S recent air-raid alarms, when the Japanese threat first reached India, called to mind a debt which the English language and the cotton textile industry owe to India's third largest city. This is the source of the name of madras shirtings, kerchiefs, and laces. To Madras came 17th-century English traders with gold for chintz, which the Hindu called *chhint;* for muslin, an Indian fabric which Europeans named after a caravan station in Iraq—Mosul; and for printed calico, named for Calicut, an old port in Madras Province.

At Madras, one-third of the way along India's Bay of Bengal coast between Ceylon and Calcutta, the East India Company established the first permanent English colonization in India in 1639. Its first governor was Elihu Yale, the Yankee-born Englishman whose India profits helped to found Yale University.

Today's plebeian cotton materials were then considered, by linen-, wool-, and leather-clad Europeans, so sheer that they were likened to "webs of woven wind." To the medieval imagination, cotton had been the fabled "wool that grew on bushes." After the English settlement, Madras was a cotton textile mecca for a century and a half. But America's finer, longer-staple cotton and the invention of power machinery finally broke its grip. Now Madras has some 60 cotton mills, but Bombay is the capital of India's seven-million-bale-industry.

At its highest point Madras lies only 22 feet above its harbor. Ship passengers can scarcely see beyond the waterfront row of buildings of the flat city. Palms and banyans arching over the streets make Madras appear a tropic grove. Many of its shops have gardens in front. Stately homes of its merchant princes are set in parklike compounds. The 1931 census showed Hindus outnumbering Christians and Moslems five to one in the city's 645,500 population.

* * * * *

RUSSIA'S VOLGA IS EUROPE'S LONGEST RIVER

THE thawing of winter ice in recent weeks has opened up Europe's longest river, the 2,300-mile-long Volga, which normally is a big Russian trade route. Industrial cities have sprung up around it in order to take advantage of its transportation facilities. Downstream float rafts of logs on their way to the Caspian Sea. Upstream, tankers churn to northern industrial centers and battlefronts with oil from Baku fields. The old Volga boatmen, the serfs who used to haul barges by heavy ropes, have been replaced by steamboats which now pull the barges.

Rising in the marshes of the Valdai Hills, about halfway between Leningrad and Moscow, the Volga flows north and east past Moscow to Kazan, where it swings southward to Astrakhan and into the Caspian Sea. It drains an area twice the size of Texas. If stretched in a straight line, it would reach across the United States from Norfolk to Los Angeles.

Not far from its marshy source, the river flows through the rich industrial centers of Kalinin and Yaroslavl, where one of Russia's largest textile plants is situated. At Gorki, formerly Nizhni Novgorod, one of the country's oldest and best-known cities, the Volga makes a junction with the Oka River, and flows on to Kazan, once capital of the mighty Tatar kingdom. Turning south, and collecting water from its Kuma tributary, it rapidly increases in size as it crosses the

UMI

be Siamese twins, may be right-handed or left-handed, and may be haunted by a ghost. Twin crystals occur when two formations develop within the same hexagonal shape, all planes and angles nearly coinciding. An off-center crystal veering to the left is called "left-handed." Crystals are useless for radio if flawed by cloudiness or impurities, known as ghosts, veils, needles, and bubbles. Some have been found to enclose imprisoned drops of water, aeons old.

Preparing a chunk of crystal for its radio debut as a slender quartz plate, inspectors cut it with special regard to its crystal backbone. Carved parallel to the backbone, or axis, its efficiency is affected by heat; carved at an angle, it can practically ignore the weather. Small circular metal saws, often diamond-toothed, slice a single big crystal into plates about an inch square. Each slice of crystal, about 1/10 of an inch thick, is ground and polished until both faces are exactly parallel, accurate to the millionth of an inch. The thinner the plate, the higher its frequency. Then, like the aristocratic diamond, this glittering sliver of stone is ready for war work. Some of it goes into scientific optical instruments.

The crystal's cloudy cousin, flint, was one of mankind's first weapons, in Stone Age arrows and axes. Now the United Nations need Brazil's crystal to patrol war communications. War brought six times as great a demand for Brazilian quartz in 1941 as in 1937. Japan bought more than the U. S. until last year.

The "Brazilian pebble" patrol over radio waves is a recent improvement on Marconi's miracle. Over a century ago scientists were studying quartz's piezo-electric effect—a name introduced in 1881. The World War drafted quartz crystals for submarine detection, and in the following decade tried them on ether duty. Now nearly all the 900 commercial broadcasting stations, the vast majority of the aviation and military radios and the 5,200 ship stations, and about a fourth of amateur transmitters have quartz crystal fingertips on their frequency pulses.

Bulletin No. 4, May 11, 1942.

U. S. Navy

AT SEA, WHERE IT FIRST SERVED, THE QUARTZ CRYSTAL "COP" STILL PATROLS

The piezo-electric effect of quartz crystal was first put to practical use in a device for detecting the presence of submarines. An outgrowth of this early use is the apparatus now employed for depth-sounding by ships at sea. The most important service of the flinty crystal, however, is in radio communications, where it keeps a transmitter on its assigned frequency. This duty makes for reliability of contact between ships at sea, between aircraft and bases, and in ship-to-shore communications. On patrol duty keeping watch against enemy planes, with a special need for quick reliable contact with defense centers, is the U. S. Navy's mammoth four-engined bomber, capable of carrying two or three tons of bombs. For speed in the air, the bomber raises its two floats to continue the line of the wingtips.

steppe to Stalingrad in the German Autonomous Republic. Below there it branches into a number of side channels, flowing past Astrakhan through a large delta.

* * * * *

LIBIAN DESERT DWELLERS PLUG NOSES AGAINST THE KHAMSIN

THE sand-laden, fiery wind—the khamsin—which recently brought fighting in the Libian Desert to a wilting standstill, whistles and swirls over the parched and heated desert from the southeast for 50 consecutive days, beginning usually in March, but sometimes as early as February. The name, khamsin, means "fifty days." Temperatures during this time have been reported as high as 135 degrees.

Although warring nations in this area have been forced to lay down their arms and ground their planes, the Egyptians living in the desert region celebrate the first day of the "blow" with great festivity.

"Shem En Nessim", they call this day, or "the smelling of the breeze." And smelling it well may be, for the hot enervating wind carries an odor all its own, and even its slightest movement is easily recognized.

On this first day in the oases, barley from the new crop, and onions which have been placed overnight under pillows—"to make the sleeper more energetic"—are hung over the outer doorways of all the houses. This ensures "refreshment" to the family until the next season. "Refreshment" also comes to the native who carefully plugs one of his nostrils with pungent onion, around which he inhales the "cooling" air. Another of the first day rites is an annual bath before dawn.

Bulletin No. 5, May 11, 1942.

Lehnert and Landrock

THE KHAMSIN IS ONE OF THE WINDS THAT SCULPTURE THE DESERT DUNES

The burning, sand-charged spring wind of the Sahara, known in Egypt as the khamsin, assumes numerous names as it sweeps across North Africa. In Algeria it is the sirocco. In the deep Sahara it is known as the shahali, meaning "wind from the south." Elsewhere it is referred to as the harmattan and the simoon. The violence of the sandstorms it carries has halted modern mechanized battles as well as traditional camel caravans. The wavelike sand ripples and dunes in the photograph are examples of the forms in which desert winds pile up the sand. In the western part of the Libian Desert all efforts to establish boundaries have been defeated by the winds, which blow sand dunes about and obliterate landmarks.